

REACTION

Chemical Magazine / Sixth Edition

Optimizing value in
today's changing global
petrochemicals market



cutting through complexity

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**The UK Patent
Box:** The newest
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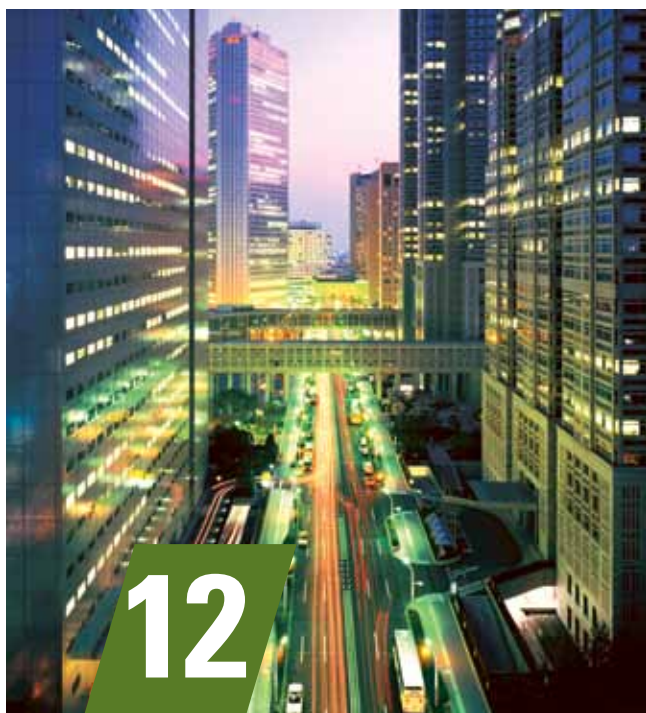
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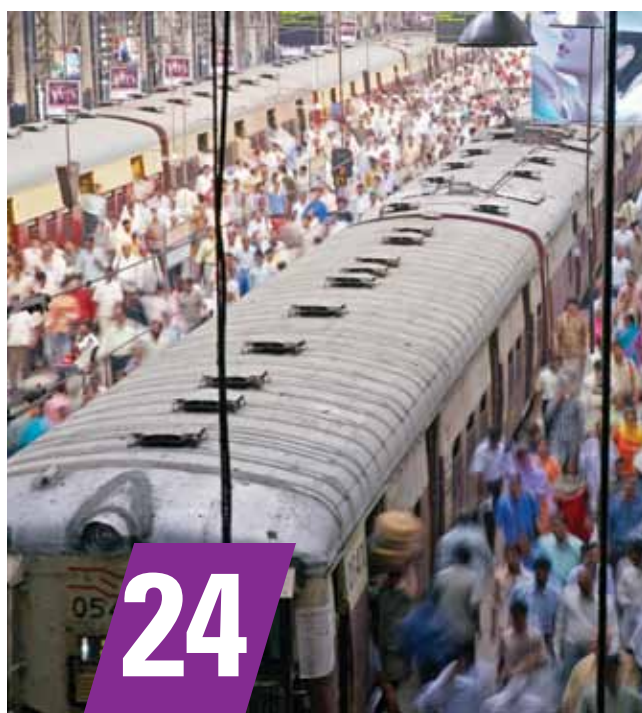
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Introduction

Welcome to the Sixth Edition of Reaction Magazine. As we come to the end of the first quarter of 2012, the watch-word continues to be 'uncertainty', albeit performance across the chemicals and performance technologies industry is holding up reasonably well and there are increasing signs of recovery in the wider economy, notably in the US.

In this issue, we bring you an update on the various tax-efficient IP incentive regimes available to chemical companies operating in Europe, as well as a double feature focusing on the application of operational excellence in petrochemicals.

Elsewhere, we continue to be active in the industry – our Global Chemicals and Performance Technologies Steering Group was represented at the Society of Chemical Industry dinner in New York and will be at the Chemical Business Association lunch in London in April.

We'll be back with the next edition of Reaction in June. As ever, we are interested to hear your views and if there are any topics you would like us to cover, please don't hesitate to contact us.



Mike Shannon
Global Chair

Chemicals and Performance
Technologies



The UK Patent Box:

The newest entry in Europe's tax-efficient IP incentive regimes

by

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The chemicals sector is rich in patents and innovations. Chemical groups can access several important tax incentive regimes in Europe which focus on innovative businesses. The new UK Patent Box offers a significantly reduced rate of corporation tax for income generated by qualifying Intellectual Property (IP). The result can be real tax cost savings and a reduction in the effective tax rate (ETR). Chemical companies operating in Europe should fully understand the benefits of the UK Patent Box – and how it compares with other IP tax incentive regimes in terms of tax rates and other key factors.



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The UK Government expects the regime to cost the Exchequer in the region of £1.1 billion, which in the current environment underlines the Government's readiness to encourage high-value jobs in the UK.

Today's multinational companies in Europe benefit from an increasing number of IP-friendly jurisdictions from a corporation tax perspective. For the chemicals sector, these incentives can be applied to the sale of innovative products, advancements in production processes, licensing income, and the provision of services.

The UK Patent Box is a measure designed by the UK government as part of the Corporation Tax Reform and features in the Government's growth agenda as outlined in "Plan for Growth" published in March 2011. The measure was announced in 2009. After two rounds of consultation, draft legislation was published on 6 December 2011 with the measure expected to be in effect from 1 April 2013. The Government states that the objective of the regime is:

to provide an additional incentive for companies to retain and commercialise existing patents and to develop new innovative patented products. This will encourage companies to locate the high-value jobs associated with the development, manufacture and exploitation of patents in the UK and maintain the UK's position as a world leader in patented technologies.

Alongside this, one of the other aims of introducing the regime in the UK was for the UK to become a more competitive location to hold IP, especially given the number of other IP tax incentive regimes that have been introduced across Europe since 2007. As the Government confirmed,

the introduction of the Patent Box in the UK would further the Government's aim of ensuring that the UK is an attractive place to do business, and that businesses in the UK can compete effectively within the global market place.


The very nature of IP makes it extremely mobile. Companies can seek to locate IP in the most tax-efficient location, given that it can easily be detached from the territory in which it was developed and moved offshore. Retaining IP in the territory in which it was established is another key objective of the UK.

» Key benefits for the UK Patent Box

The UK Patent Box offers serious tax savings, by reducing the corporation tax rate from 23 percent (2013) to 10 percent for profits generated by qualifying patents. The UK Government expects the regime to cost the Exchequer in the region of £1.1 billion, which in the current environment underlines the Government's readiness to encourage high-value jobs in the UK.

The Patent Box will benefit a number of sectors, the obvious ones being chemicals and pharmaceuticals along with manufacturing, electronics,

and defence. Furthermore, it is likely to encourage companies that are developing innovative products — who may not have thought of it previously — to patent in order to take advantage of this new corporation tax regime. In fact, the UK regime only requires one patent in a product for the total income generated by that patented product to qualify. Inevitably there will be a trade off for some companies who have not traditionally patented items (in order to retain trade secrets) versus the cost benefits of the new regime.



The UK Patent Box offers serious tax savings, by reducing the corporation tax rate from 23 percent (2013) to 10 percent for profits generated by qualifying patents.

» Comparisons with other European regimes

At 10 percent, the UK Patent Box offers one of the higher headline rates, but an understanding of how it compares to regimes offered by other European countries should be based not only on rates but also on a number of other key attributes.

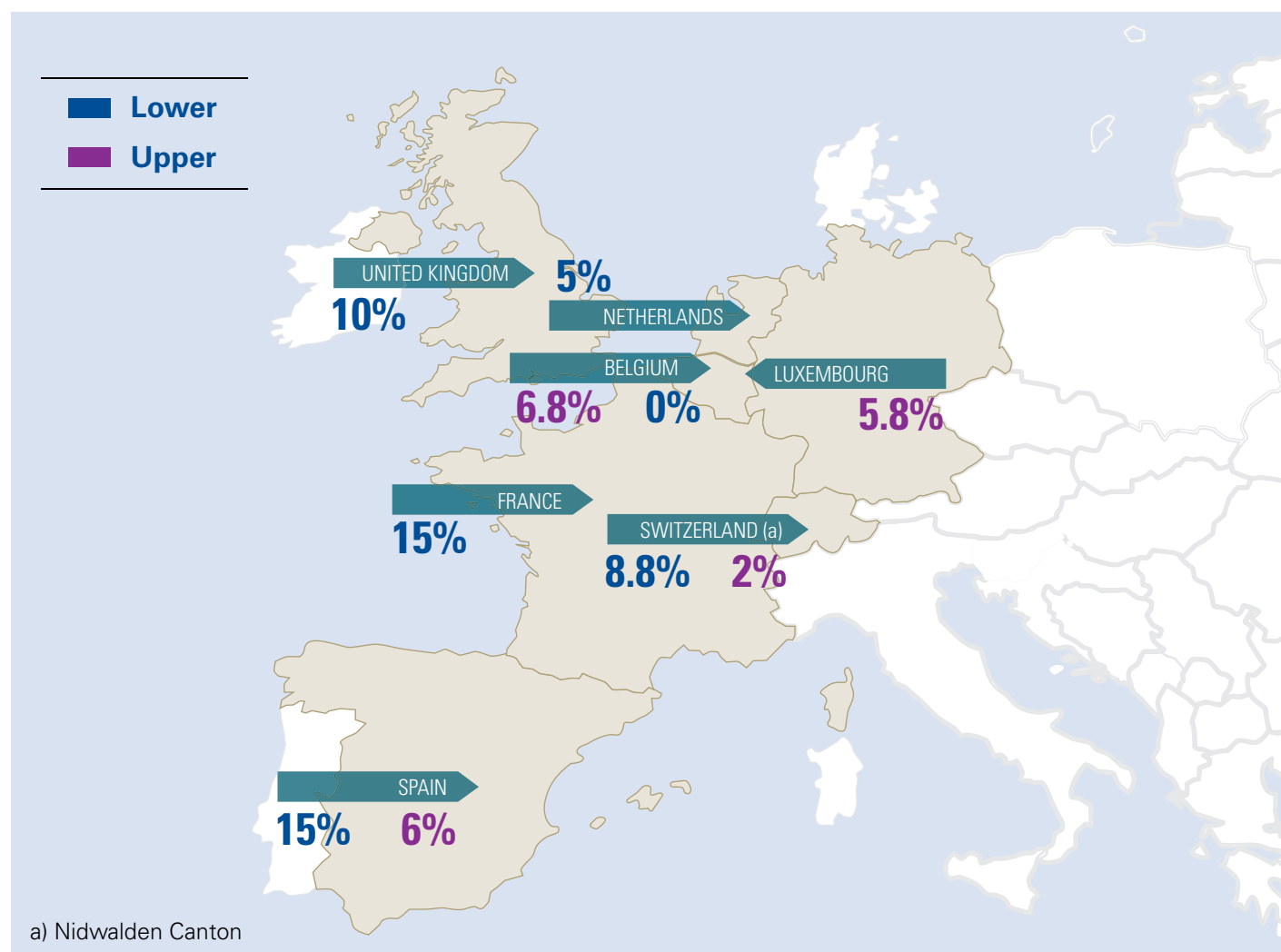
Tax rate

In terms of the rates themselves, they are generally lower on the continent than in the UK, although there are exceptions. At 15 percent, the effective rate in France is 5 percent higher than in the UK, and Spain ranges from 6 to 15 percent. In contrast, the Netherlands IP incentive regime, known as the Innovation Box, offers one of the lower rates at 5 percent. Belgium

offers between 0 and 6.8 percent and Luxembourg no more than 5.76 percent. Switzerland is unique in that the country does not have a national IP incentive regime. Instead, rates are offered on a canton-by-canton basis. The canton of Nidwalden offers an IP Box with a rate between 2 and 8.8 percent. Other Swiss cantons offer a variety of rates, often negotiated with individual companies.

Switzerland is unique in that the country does not have a national IP incentive regime.

R&D incentive tax rates



Source: KPMG analysis



infringements will qualify. Similarly the Dutch regime allows worldwide income in the form of patent licensing income; product sales (that can be allocated to qualifying IP) and capital gains realized on qualifying intangible assets. The Netherlands also allows outsourcing of R&D activities abroad.

The Swiss Nidwalden IP Box is also broad in its application as it extends to worldwide income in the form of all types of IP income and capital gains.

The regimes in the other territories are in some respects slightly more restrictive as they focus on pure royalty stream incomes. The Luxembourg and French regime also permit capital gains arising on the disposal of qualifying IP.

Ownership of IP

The majority of the regimes recognize both beneficial ownership and legal ownership of the patent or IP. The Belgian regime allows co-ownership of the patent or, in the case of the UK Patent Box regime, cost-sharing arrangements. Partnership business models will also qualify.

Qualifying IP

The UK Patent Box applies to patents granted by the UK Intellectual Property Office or the European Patent Office. It also applies to regulatory protection data, supplementary protection certificates, and plant variety rights. A proposal has been made that a white list of EU territories will be produced and that patents registered within those jurisdictions will also qualify.

A number of European regimes have a broader definition of IP than the UK, partly through a desire to attract the maximum number of companies. The Netherlands Innovation Box includes self-developed patents (certified in territories that have a comparable patenting regime to the Netherlands), unpatented intangibles from R&D certified activities, and plant breeders' rights.

The Luxembourg IP incentive regime covers software, copyrights, patents, trademarks, service marks, domain names, and design and models. The Swiss IP Box in Nidwalden is also broad in

definition and applies to all income from IP under the OECD definition.

The regimes in several other countries have a more rigorous definition of IP. For example, the Belgium Patent Box is limited to patents. At the same time, it extends to patents registered in any territory, so in that respect it is wider in scope than the UK Patent Box. The French regime applies to European patents, plant variety protection certificates, and manufacturing processes directly linked to a patent or patented invention.

The Spanish regime extends to patents, drawings, models, plans and formulas, secret procedures, and rights on information relating to industrial, commercial or scientific experience.

Qualifying income

Under the UK Patent Box regime, worldwide income in the form of patented product sales; pure royalty income streams; income from embedded notional royalties in patented processes; patent sale income; and compensation income from patent

Summary of the regimes

In terms of settling on a location in which to hold IP to qualify for an IP incentive regime there will be a number of factors to consider alongside the potential benefit obtainable from the regime. These include Research and Development (R&D) requirements, whether the territory has the appropriate skills to develop the IP, on-going maintenance of the structure, set-up costs, and existing presence in the territory.

The lowest tax rates are available in Belgium, Luxembourg, Netherlands and the Swiss canton of Nidwalden. The widest range of IP that qualifies for the reduced tax rate appears to be in Luxembourg, Netherlands and Switzerland as these regimes are not restricted to patents. The UK is also competitive because a wide variety of income relating to patents will qualify. The UK, Netherlands and Belgium offer the most flexible business models for ownership of patents.

➤ Considerations for the Chemicals Sector

The UK Patent Box is quite flexible in encompassing all categories of income which relate to qualifying IP. For example, relevant income from services which use patented processes, including toll manufacturing, will qualify. Groups which are relocating manufacturing capacity should consider whether the processes depend on qualifying IP which could give rise to a separate technical fee qualifying for an incentive regime.

IP is developed and owned in a multinational group in various ways. The UK Patent Box regime acknowledges that legal ownership can be centralized

for protection reasons and separated from the group companies which have developed the IP. The regime also acknowledges that many companies in a group can be involved in development, including cost-sharing arrangements common in the chemicals sector. As a result, the UK regime does not depend on legal ownership of the IP to qualify. It also recognizes that the qualifying company does not need to have performed all of the development so long as it is involved in the active management of the IP. Such flexibility is very welcome.

The choice of regime does not depend solely on the features of the Box, but should also be considered in the context of other tax considerations, such as R&D incentives. Finally, although tax attributes on their own are unlikely to determine commercial behaviour, the differences in tax costs between exploiting a favourable regime and not exploiting it can be significant. As a result, it is important that the Tax Function participates in discussions about IP in the business, and considers how the company can best gain access to such regimes.





Petrochemicals: Working to **optimize value** in today's changing global petrochemicals market

by

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The petrochemicals sector continues to face multiple challenges, including the cyclical nature of the industry, product commoditization, constant technology creep and the emergence of new competitive threats. The current global economic environment combined with geographical constraints and the global drift to the East serve to further intensify the effects of such challenges. However, as with many challenges, opportunities are created for those that think and act differently.

Based on our experience, the most important sector challenges today include:

- Rapid and major shifts occurring in the balance of global supply and demand
- Changes in feedstock mix, sources and pricing structures that alter the global competitive landscape
- Stability and risk management of supply chains containing financially leveraged components including refineries
- Reduced barriers to global trade, thereby driving increased competition in mature markets and opportunities in emerging markets
- New market entrants and technological advances that disrupt the incumbents and impact product pricing power in the face of rising production costs
- The growth of the environmental agenda that will depress consumer

purchasing of products derived from petrochemicals and drive up both the costs of operations and future capital investments

- Inflationary effects within emerging economies
- The need to sustain and build upon operational efficiency initiatives undertaken since the onset of the global financial crisis

These challenges are affecting regional markets differently, creating localized sets of conditions that need to be addressed to remain competitive and maximize value. In addition, management challenges are being compounded by the uncertainty that many of these challenges place on their business and also the speed at which changes are occurring. In this article we will offer our insights about how to address these challenges. We will also look at current conditions in a variety of key markets.

Challenges are affecting regional markets differently, creating localized sets of conditions that need to be addressed to remain competitive and maximize value.

Investing in growth markets: establishing operational strategies to drive long term returns

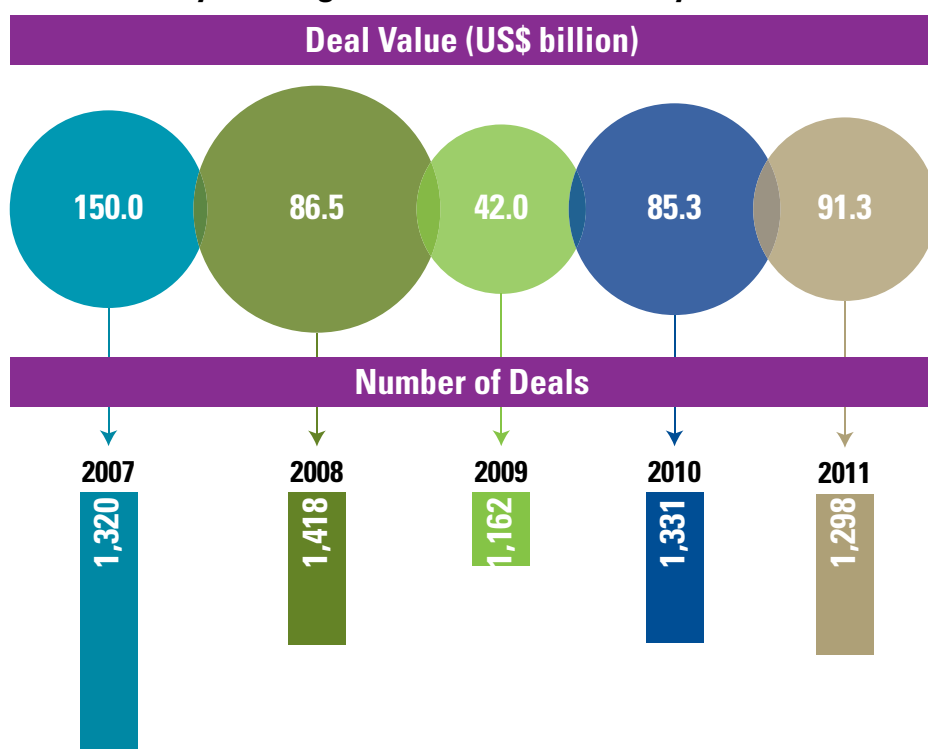
Given the growth in demand and potential rewards, Western companies have been keen to enter the burgeoning East and South Asian markets, and they have typically done so through a variety of partnering arrangements with local players and government backed entities. These arrangements have provided mutual benefits to both parties: domestic partners have gained access to advanced western manufacturing technology and knowledge while Western partners have typically gained access to feedstocks and, importantly, local markets and knowledge.

Such relationships provide an attractive means for entering the market, but unless they are set up effectively they create complexities from a portfolio management perspective, and limit access and transparency of management information to the owning partners. In our experience, this often impedes effective and timely decision making, typically resulting in slower responses to market movements and inconsistent performance across portfolios where more than one partnering arrangement exists. With each operation effectively acting as

an individual company, many of the advantages of scale and footprint are lost, typically weakening pricing positions and eroding margins.

We expect to see a continuation of the establishment of new JV structures, but we also anticipate a movement towards simplification and consolidation of existing ownership models to reduce complexity and drive efficiencies. Indeed, in recent years alternative methods for foreign entry have become more extensively available, including the wholly foreign owned entity.

M&A activity in the global chemical industry



Source: Thomson One Banker, accessed on 17 January 2012

We are gearing up for next phase of growth through a combination of our own initiatives and foreign new partnerships with leading companies.

Reliance



“Market entry into emerging economies often requires joint ventures and alliances. Making the deal is quite easy, hanging on to the deal and extracting value is difficult. The great majority of JV’s into emerging economies under-deliver or fail, making deep expertise, and building corporate capability in operating and governing these joint ventures essential for success. It is not just a matter of cross-cultural sensitivity. JV’s have a complex dynamic of their own!”

— Dr Marc van Grondelle, Head of Joint Ventures, KPMG in the UK

In addition to operational and portfolio management complexities, there are further factors that can drive significant performance differences and should be addressed when pursuing new opportunities. These factors include:

- JV partner management philosophies and values
- The level of influence exerted by surrounding assets on operations

In our experience, integration with surrounding assets – whether for feedstock sourcing, utilities, by-product and captive product sales or usage of handling facilities – often has the ability to move significant value outside of the JV. Once established, changing agreements with surrounding operations are often hard to reverse and can lead to severe value erosion and strained relationships. Developing a clear understanding of the potential operating performance, costs, constraints and options for external interfaces can greatly help during pre-deal strategic planning and subsequent negotiations.

Achieving target value, and the ability to drive a performance improvement agenda can be challenging when imbalances in negotiating power exist or when JV partners hold different views on what a reasonable return on investment (ROI) should be. China, in our experience, is growing world scale markets with a significantly lower importance placed on ROI hurdle rates. In some cases, the adoption of variable cost pricing tactics are being felt across the region and globally, placing pressure on prices and challenging less-competitive domestic companies in certain markets.

Partnering through joint ventures or setting up wholly owned operations is not the only strategy available for international manufacturers wishing to participate, and indeed for a variety of reasons may not be the appropriate strategy. Other options that can be considered include the licensing of technology and intellectual property to these emerging markets, however, it is imperative that businesses select the right partners and set up the arrangements and operating controls correctly from day one to ensure that IP is not placed at risk of cannibalization or infringement.



➤ **Addressing operations:** seeking out opportunities and sound fundamentals

Key factors for successful entrants in Middle Eastern and Asian markets include a clear understanding of:

- The market potential by region and in export locations
- The total cost to serve potential customers
- The strategic options that are available

Provided that the right fundamentals are in place, companies can accelerate entry to the market through purchasing local players. However, understanding the market potential – combined with detailed insights into the underlying performance drivers of potential acquisition targets – is key to determining potential value and a safe acquisition price.

In our experience, operational constraints and potential opportunities are often not given sufficient attention during the transaction cycle (or establishment of JVs) and often result

in the under delivery of value. This may be driven by a disconnect between teams negotiating deals and teams that operate the assets. Similarly, teams that design facilities are not always the long term operators.

A number of emerging geographies have been investing in significant infrastructure improvements in recent years. In the medium term, these geographies will continue to lend themselves to envelopes of competitive advantage. Companies considering investments should take note of the state of local labor, local regulations and stability, whether the company requires a JV partner, whether it could enter

the market alone with local support, and what risks and benefits might be present. In addition, consideration should be given to the constraints on repatriating profits and growth options into neighbouring countries and markets.

Lifecycle investment costs can be dramatically reduced by considering future market scenarios and expansion planning in the design phase as well as to all elements of the operating model beyond physical manufacture. Nevertheless, this is all too often given less consideration as companies focus on the immediate need of getting the plant up and running.

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For companies considering, or establishing production capacity, there is often significant management focus on the capital project itself with a clear desire to meet budgets and first production. However, all too often in large scale capital intensive investment projects, insufficient consideration is given to the set up and structure of operating models in order to maximize efficiencies. These cover all elements of the operation beyond those simply related to physical manufacture of the product, including providing management with transparency on performance and building in flexibility to accommodate changes in demand.

Lifecycle investment costs can be dramatically reduced by considering future market scenarios and expansion planning in the design phase as well as to all elements of the operating model beyond physical manufacture. Nevertheless, this is all too often given less consideration as companies focus on the immediate need of getting the plant up and running.

» Dealing with existing assets: adapting operating strategies in response to change

In a recent KPMG survey of business leaders worldwide (Succeeding in a Changing World), executives from the chemicals industry put the highest priority on developing growth opportunities and exploiting the potential in high growth and emerging markets, improving cash and working capital management, changing business operations to achieve sustainable cost efficiencies and preparing their organizations for major business model

changes¹. While the relative importance of these issues versus others is understandable, there are a number of underlying drivers for success, spanning commercial decisions, cost management and operational excellence, as well as potentially undertaking complete value chain redesign.

For the industry as a whole, there will be a number of factors to consider when facing and responding to changing market


dynamics, such as downward pricing pressure and potential loss of volumes:

- Nurturing and retaining your best customers by understanding the true cost to serve and margins being generated
- Understanding your competitive envelopes and pricing floors to prepare for leaner times ahead
- How best to manage your fixed cost base through periods of slack demand
- The technological advancements being pursued to keep costs competitive
- The level of innovation being employed to support and create demand in the market
- Downstream industry developments, the potential volumes these represent, and the opportunities to participate in those markets
- Overcoming barriers to inter-country trading and benefitting from local incentives to develop industries

Addressing these goals will require different approaches to mitigate, establish or maintain a leading market position.



¹ Fit For The Future - CEO Guide To Succeeding In A Changing World, KPMG



Businesses need to understand if this demand volatility is occurring, what the drivers are, and what the impacts are on overall profitability of the business in quantitative terms.

Drive excellence in Pricing and Portfolio management – improve, maintain and protect margins

Supply options are increasing in many markets as infrastructure improves. However, more options mean that new threats are being introduced for established players. Due to the current infrastructure limitations — most notably in China and India — markets are often regionalized, resulting in significant variation in pricing and competition. This landscape is changing rapidly in China, where significant infrastructure investment is taking place. As rail networks and port facilities improve, we expect markets to become more liquid, increasing the commoditization of products and resulting in further downward pressure on margins. Successful companies will need to improve transparency of, and insight into the true cost to

serve for individual customers versus competitors. Extending the application and use of pricing tools and decision processes will help to both optimize their customer portfolios and drive pricing decisions that support their margin and volume levels.

Customer portfolio management remains a challenge in both established and emerging markets. For instance, in China manufacturers often find it challenging to lock-in balanced demand and smooth customer off-take patterns. While there may be a number of reasons for this, we have often observed that key drivers include the seemingly non-binding nature of agreements and lack of recourse. This in turn creates significant challenges in effectively and efficiently managing

the supply chain. This varying off-take volatility often drives margin erosion across the business. Examples include higher logistics costs driven by higher peak capacity requirements, sub-optimal manufacturing practices, excessive working capital lock-up and downward pricing pressure as sales teams look to clear inventory build-ups.

Businesses need to understand if this demand volatility is occurring, what the drivers are, and what the impacts are on overall profitability of the business in quantitative terms. Considerations to reduce the overall effects of this demand volatility could include revising the customer offer structure and incentives where possible, as well as developing efficient supply chain flexibility to cope with this variability.

Sustainably focus on both fixed and variable costs

Historically many manufacturing operations have found it easier to focus on technical solutions to either improve yields or address variable costs. However, they have typically been less successful at driving sustainable step change performance in their fixed cost base and cost initiatives often substantially underperforming on their aspirations. Furthermore, recent KPMG research has shown that where cost reduction has been undertaken, 93 percent of the reductions are expected to be unsustainable². This can be for a variety of reasons including:

- Management lacking the right tools and approaches, with cost reduction programs often focussed on short term actions (e.g. budget cuts across the board or freezing/cutting discretionary spend)
- Lack of visibility of the true cost base of the organization at a sufficient level of detail to enable a clear line of sight between improvement projects and bottom-line impacts
- Adopting cost optimization activities in the absence of robust hard economic facts and comparator insights that dispel myths and challenge the status quo
- Lack of independent external challenge to maximize potential value. Failure to execute on planned changes and address the underlying levers that actually affect the bottom line

Fixed and variable cost optimization strategies are particularly critical in mature manufacturing assets in geographies such as Europe that have high labor costs and where capital is constrained.

Application of operational excellence in manufacturing operations within emerging economies will become increasingly important as labor inflation continues at pace



While not historically an issue, a longer term challenge that many operations face relates to labor costs. Strong GDP growth over the past 20 years in many Asian countries and rapid urbanization has put sustained pressure on salaries and is gradually eroding margins and competitive position. Additionally, Chinese urban manufacturing salaries are now approximately four times higher than rural ones, and the average growth in labor costs has been as high as 30 percent year-on-year³. Wage inflation aside, the challenges are being further compounded by high levels of staff turnover, and the requirement to maintain focus on training employees and managing training costs.

At the same time, this does not necessarily mean that China will soon lose their labor cost advantage over other countries. In fact, wages are still very low compared to those in advanced countries,

as well as within many other Asian economies, including Taiwan and the Philippines where wages are 40 to 50 percent higher than China. However, with wage inflation rising significantly in recent years, Chinese labor competitiveness will likely decrease in the near term.

It must also be considered that Chinese labor productivity has been rising sharply, at about 10 percent a year since the early 1990s and even more quickly in the past decade, due to technological progress, increased capital investment and rising human capital. Chinese companies, therefore, while facing higher labor costs are also producing the same or larger amounts of goods with less people. Moving forward, we expect an increased focus on operational excellence within China as a means of off-setting the increasing labor costs.

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² The Cost Boomerang, 2011

³ Ministry of Human Resources and Social Security, Ministry of Agriculture, the People's Republic of China

There is a need to move beyond portfolio and cost management and seek out opportunities to drive further value

Above and beyond revenue and cost optimization activities, there are opportunities to think and act differently to lock in demand and create incremental value. Here there are lessons to be learned from the Japanese who have had to increase competitiveness by restructuring their industry. Improved performance is being driven through tighter value chain integration both upstream and downstream with suppliers and customers e.g. through co-location of downstream customers ensuring captive volumes, rationalization of commodity lines such as PE and styrene, and increasing focus on specialist products such as functional resins and high-performance films. One example of capacity rationalization

can be seen in polyvinyl chloride (PVC) production, which has been reduced in response to significant overcapacity in China. Japan's competitiveness is also supported by the country's leading position in R&D innovation, which is likely to be a major advantage moving forward.

The most successful companies have established a flexible design with a lean and variable cost base that allows nimble response to changing market needs. They have combined this with a clear customer and operating strategy that ties in baseline volumes and prices that are built on a very clear understanding of the total cost to serve and the competitive envelopes surrounding those customers.

The most successful companies have established a flexible design with a lean and variable cost base that allows nimble response to changing market needs.



Conclusions



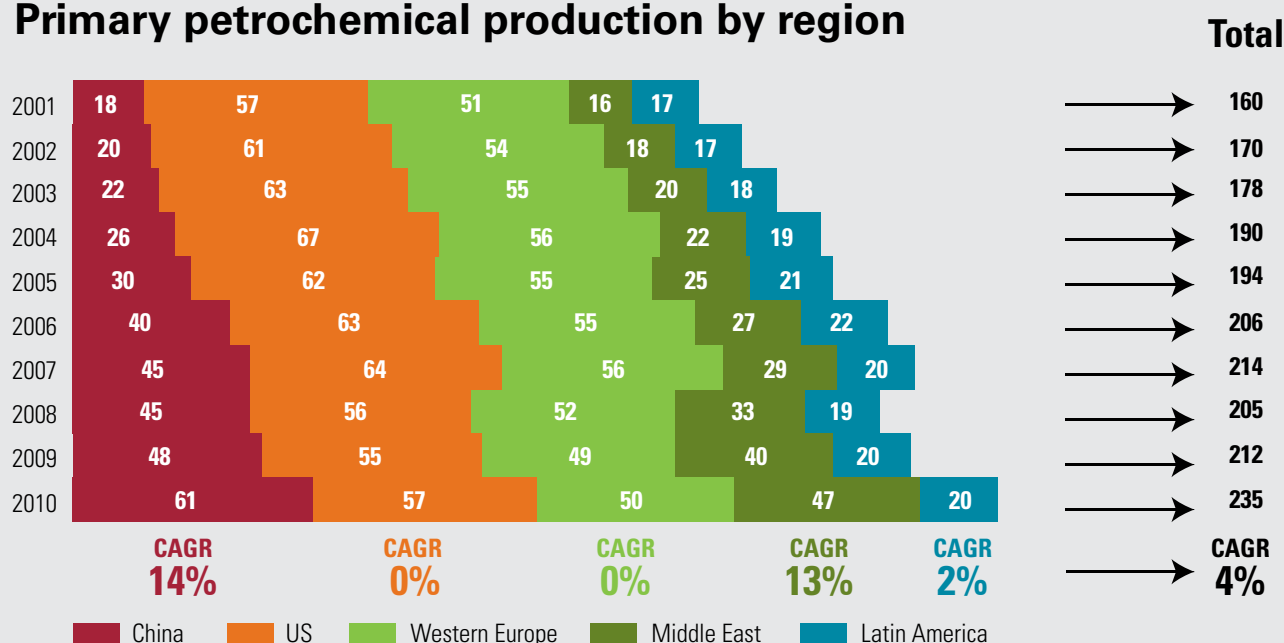


- Most Asian countries are in the process of increasing petrochemical capacity to support short-term demand in the region
- As the Middle East petrochemicals industry continues to diversify and exploit their advantaged feedstock, companies elsewhere will increasingly be challenged in pricing, feedstock sourcing and volume retention
- A key step for companies in preserving value will be to understand the true margins earned across the portfolio by analyzing the total cost to serve and establishing competitive positions customer by customer
- Expansion in Asia and the Middle East is likely to be through a mixture of active JVs, organic growth by incumbents, as well as increased levels of pure licensing
- Companies entering new markets need to carefully consider their operating structures and partner selection to align on objectives and maximize value. This includes balancing tradeoffs between the specific deals and longer term market participation strategies, as well as access to advantaged feedstock versus geopolitical supply disruption risks
- Some geographies may face challenges in financing, logistics, skilled labor and technology availability to fulfil their expansion plans and remain competitive
- Appropriate operational strategies will need to be developed in order to maximize competitive positions and respond to any downturns
- Historical petrochemical powerhouse regions like Europe and Japan are beginning to increase efficiency through adoption of the right tools and approaches to drive operational improvements and be ready for potential overcapacity in the region
- These trends are taking hold and opportunities exist for companies to capture leading positions as groups realign their portfolios

Appendix – Key Petrochemicals Markets

Supply and demand continues to march to the East

Primary petrochemical production by region



Source: Petrochemical Industry Overview, SRI Consulting, April 2011

In terms of demand growth, Asia has undoubtedly been the greatest success story for the industry over recent years, driven predominantly by China. Many Asian countries have encouraged investment to become self-sufficient across the petrochemicals spectrum and, in some cases, to become regional exporters. However, while we still see opportunities across the region, in many products we see significant challenges for Asia as markets go long and new capacity continues to come on-stream.

The effects of China's surging demand are being felt across the region and countries are responding in different ways. For example, Japan is increasing value chain integration and rationalizing commodity product capacity⁴. Korea continues to undertake significant expansion in xylenes capacity and other areas. The recent economic downturn, combined with changes in currency

strengths, has reduced exports and domestic demand in several Asian countries. It is our view that regional challenges will only increase as China, product by product, moves into a long domestic position and begins to look outwards for new markets.

In 2010 Malaysian production was marked by surging export demand

Geographically we are disproportionately weighted towards Asia, the growing region of the world and underweighted in the slower growing, slower developing societies such as the United States and Continental Europe. That positioning will only grow in the future.

Celanese Corp

⁴ See: *The Japanese Chemical Industry – Finding the right path*, KPMG, June 2011



across the industry and expectations that leading local players would expand their facilities. However, with regional neighbours also aggressively expanding petrochemical capacity, continued growth and profitability will likely depend on clarifying and establishing clear competitive advantages and differentiation.

Indonesia is experiencing strong growth in petrochemical demand which is outstripping increases in production capacity. With undercapacity in refining and resultant shortages in naphtha, the country has relied increasingly on imported materials, with an increase of almost 50 percent in plastic imports over the past year alone. Recognizing this continued challenge, the government has directed the state-owned oil refiner Pertamina to construct three additional refineries by 2020, which may present opportunities for international participation in the Indonesian domestic market.

Among the Asian countries, possibly the most interesting development is the growth of petrochemicals in India, a market that presents considerable growth opportunities. A number of global petrochemical majors have recently

stated that India, along with China, would drive the majority of their future product growth. The Indian chemicals industry accounts for roughly 3 percent of GDP, or US\$40 billion, and with a 14 to 15 percent annual demand growth since 2005 has far exceeded domestic capacity growth of 3 percent to 4 percent. For example, year-on-year polypropylene (PP) and polyethylene terephthalate (PET) demand has increased by 18 and 24 percent respectively, driven by growth in the automotive and packaging sectors. Approximately 130 kilo tons per annum (ktpa) of styrene butadiene rubber (SBR) are currently being imported to meet the 10 percent annual increase in demand. There are significant opportunities to import or establish local manufacturing, and the rate of capacity increase is expected to grow from 12 to 15 percent in the next five to seven years⁵. Of interest will be the key drivers for participation, e.g. meeting local supply requirements or developing diversified downstream industries, and how the balance of state-directed and private sector investment develops.

With various forecasts predicting polymer demand to exceed 20 to 25 million tons by 2020, the scale of

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opportunity in India becomes clear. A world-scale cracker would need to come on-line each year until 2020 to match demand, and significant expansion is taking place, with many new JVs developed in recent years to add SBR capacity⁶. Much of the development will undoubtedly take place in and around the government-designated petrochemical investment zones of Haldia in West Bengal, Paradeep in Orissa, Vishakhapatnam in Andhra Pradesh and Dahej in Gujarat where BP and the Indian Oil corporation recently signed a memorandum of understanding to develop a 1 million tons per annum acetic acid plant.

⁵ <http://indiacurrentaffairs.org/indian-petrochemical-capacity-set-to-grow-12-to-15-per-cent/>

⁶ <http://www.marketresearch.com/Business-Monitor-International-v304/India-Petrochemicals-Q3-6441044/>

No petrochemicals article relating to supply changes would be complete without some discussion on the Middle East and Saudi Arabia in particular. The region has seen major investment in recent years, diversifying operations and enhancing margins captured across the downstream value chain⁷ while supporting job creation. Local expansion of the petrochemicals industry has been supported by the abundant supply of advantaged feedstock and cheap energy. This combination has moved Saudi Arabia from a net importer to one of the largest global providers of petrochemical products. In the past year alone Saudi Arabia has increased petrochemical export value by 41 percent and the expansion will continue. For example, the development currently being pursued by Dow Chemical and Saudi Aramco will result in one of the world's largest integrated petrochemical complexes coming online in Saudi Arabia in 2015, producing 3 million metric tons of polyethylene, polyurethanes, propylene oxide, propylene glycol, elastomers, glycol ethers and amines⁸. Such changes will have far reaching effects, placing competitive pricing pressure on other more expensive sources of production, as well as potentially placing increased pressure on feedstock supply for other manufacturers⁹. This story is repeated elsewhere in the region, with numerous examples of international companies establishing new joint ventures (JV's). However, investors will need to consider the balance between access to advantaged Middle Eastern feedstock and geopolitical risk in the region that could potentially disrupt supply.

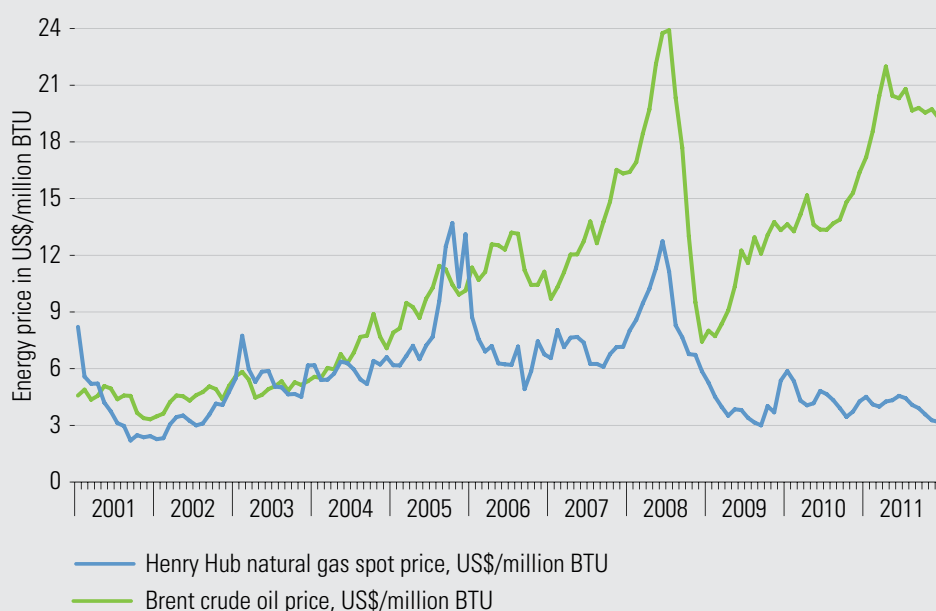
The overall structure of the petrochemicals industry in the Middle East is also changing in other ways, with an increased investment in naphtha-fed plants as opposed to natural gas. This has resulted in an expanding range of downstream products now making their way into world markets (the previous edition of Reaction includes a detailed discussion of the challenges facing the chemical industry in the Middle East).

Given the relative immaturity in domestic Middle Eastern downstream markets, and production costs that may be as little as a third of those found in Europe or Asia, it is likely that Middle Eastern supply will pose significant challenges for competitors. There is a likelihood that large volumes will need to be placed in other markets. While surveys suggest the majority of product will be directed towards China, the rest of Asia and the Middle East, it is possible that product will be placed into Europe given that Middle Eastern manufacturers have a competitive cost to serve to both the Asian and European markets¹⁰. These

changes may well continue to alter the supply and pricing landscape.

In recent years we have seen Asian petrochemical product and feedstock pricing place increasing pressure in several commodity product segments. However, we believe that markets may need to adapt and respond to Middle Eastern pricing should domestic demand not keep up with supply. In a bid to capture volumes and achieve break even utilization, Middle Eastern producers may turn to aggressive pricing in established markets.

Oil & Gas Price Comparison



Source: IMF Primary Commodity Prices, accessed on January 12, 2012.

In the past decade, a major differential has opened up in the prices of ethane and naphtha globally ... The European producers are the most affected as they find it increasingly difficult to compete with low cost petrochemicals from the Middle East.

BASF SE

⁷ "Saudi Petrochemicals Sector: Current Situation & Future Prospects", SAMBA Bank of Saudi Arabia, August 2009

⁸ "Dow & Saudi Aramco Embark on World's Largest Chemicals Project to Drive Downstream Growth", press release, Dow Chemicals, 2011

⁹ Central Department of Statistics & Information, Kingdom of Saudi Arabia

¹⁰ KPMG analysis

European outlook remains weak

In contrast to Asia and the Middle East, European production and demand growth has been much slower, and in the longer term, may face flat or declining internal supply volumes. The last significant capacity increases were in the form of mid-scale (about 600 kta) PTA plants in Poland and Portugal (projects commissioned pre-recession), while approximately 800 kta of ethylene production capacity is expected to come online in 2012 slightly further east in Aliaga, Turkey. The last cracker to be built in Europe was in the mid-1990s. In addition, there may be further production challenges ahead given the ongoing weakness in the European refining landscape.

Some product categories are approaching the crest of the cycle, and Europe's industrial maturity, modest growth and strong green agenda has further impacted growth. As a result we are starting to see an increased focus on capturing volumes through

strategies such as co-location and increased integration up and down the value chain. For example, BP recently announced the co-location of a large PET producer at their Belgian facility, while Total announced the intention to merge their refining and petrochemicals businesses. Furthermore, the general trend in Europe appears similar to that of Japan's: stepping away from commodity chemicals and focusing more on specialty products.

Where investment capital is committed in Europe, this will be focused on driving cost efficiency, decreasing energy intensity, debottlenecking and general plant modernization including increases in feedstock flexibility.

However with many oil majors continuing to shed European refining capacity, and the longer term issues and instabilities created by the Eurozone crisis, continued investment decisions look anything but assured.

Some product categories are approaching the crest of the cycle, and Europe's industrial maturity, modest growth and strong green agenda has further impacted growth.



The US sector is undergoing a renaissance

The US petrochemicals market is resurgent on the back of shale developments which are providing long-term sustainable cost-advantaged feedstock to the petrochemical sector. From a position a few years ago when the US had some of the highest gas prices in the world, with no prospect of an increase in petrochemical capacity; about 7.6 million tons of new capacity has been announced in the last twelve months due to the availability of advantaged ethane¹¹. The challenges for US producers will be finding a market for these products – the US is mature and the American Chemistry Council expects domestic petrochemical demand growth in 2012 and 2013 no higher than underlying growth in GDP¹².

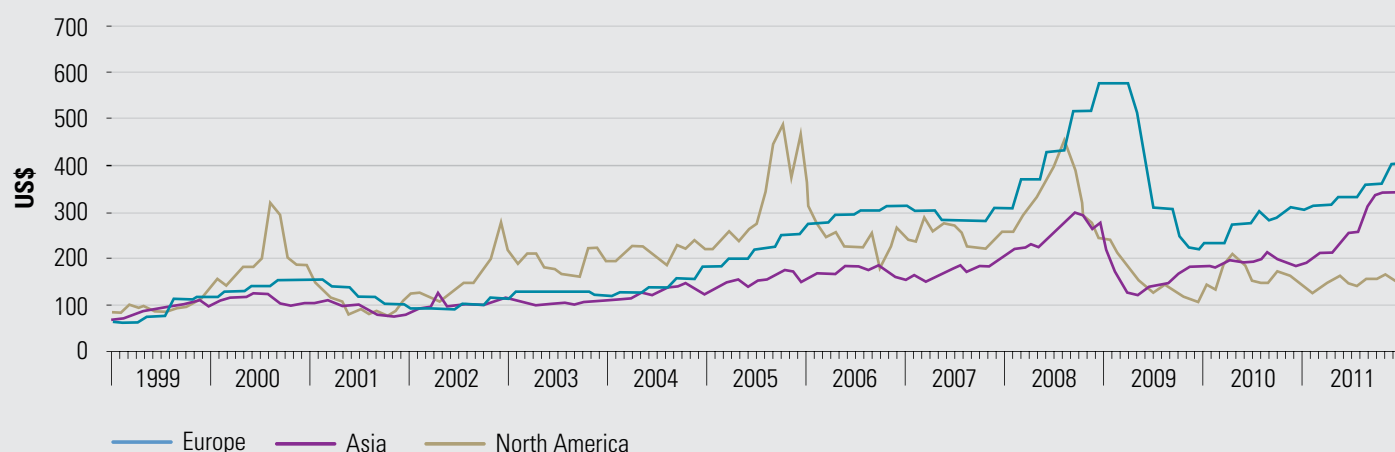
Recently, there have been a number of factors that have moved in favor of the US markets. Resurgent demand, changes in the feedstock landscape and a weaker US Dollar have created

opportunities to fundamentally alter the cost-competitive landscape. As a result of aggressive cost reduction initiatives during the downturn, US Gulf Coast ethane reserves and the recent expansion in shale gas, the US petrochemicals industry is now second only to the Middle East in terms of cost advantage. This is spurring investment in neighbouring markets, with Braskem and Idesa recently breaking ground in Mexico on a US\$2.5 billion plant to produce 750 kta of high-density polyethylene (HDPE) (750 kta) and 300 kta of low-density polyethylene (LDPE)¹³.

From an investor's perspective, there has also been an increase in opportunities for acquiring value assets as the US market restructures itself. However, careful consideration needs to be given to operational constraints and margin drivers.

The US petrochemicals market is resurgent on the back of shale developments which are providing long-term sustainable cost-advantaged feedstock to the petrochemical sector.

Shale gas is improving feedstock competitiveness in North America



Source: Petrochemical Industry Overview, SRI Consulting, April 2011

Note: "For Europe: Russian natural gas border price in Germany, US\$ per thousands of cubic meters of gas. For Asia: Indonesian liquefied natural gas in Japan, US\$ per cubic meter of liquid. For North America: natural gas spot price at the Henry Hub terminal in Louisiana, US\$ per thousands of cubic meters of gas."

¹¹ "Petrochemicals: Stronger demand expected", Chemical Week, January 2/9, 2012

¹² ACC, January 2012

¹³ "Shale production could mean 3 more Ethylene XXIs – minister", Business News Americas – English, October 25, 2011

KPMG in the Industry

In this feature, we update you on some of the ways we have been involved in the industry since the last edition of Reaction. It has been a busy few months for our Global Chemicals & Performance Technologies team as we stay embedded in the heart of the industry.



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GULF PETROCHEMICALS & CHEMICALS ASSOCIATION

KPMG at the Gulf Petrochemical and Chemical Association (GPCA) Forum in Dubai

KPMG once again demonstrated its leading presence in the chemical industry at the sixth annual GPCA forum held last December in Dubai.

The event kicked off with a CEO round table attended by European head of Chemicals and Pharmaceuticals Chris Stirling and Global COO for KPMG's Chemicals and Performance Technologies Practice Paul Harnick, during which the leaders of over 30 key clients in the sector debated a wide range of issues.

KPMG launched a special fifth edition of Reaction magazine, in association with the GPCA. The publication focusses on the challenges facing the Middle East chemical industry as it seeks to develop downstream – building on its current strength as a hub of global petrochemical manufacturing.

The paper received prime billing in the official conference press through a number of interviews given by Paul Harnick, while UK partner Andrew Monro discussed the themes in a keynote speech, followed by a panel session with a number of other industry leaders.

Reaction magazine is available for download or on-line viewing at www.kpmg.com/reaction



Society of Chemical Industry Dinner

KPMG in the US's Chemicals and Performance Technologies practice recently served as a platinum sponsor of the 79th annual Society of Chemical Industry (SCI) America International Group Medal Award Dinner. The 2012 medal was presented to David N. Weidman, Chairman and Chief Executive Officer of Celanese Corporation, in recognition of his outstanding leadership skills, public policy advocacy and many contributions to applied chemistry that have contributed to the progress of the entire industry.



Chemical Industry Association of Germany ('VCI')



KPMG in Germany recently co-sponsored the VCI's full-day workshop on the Chemicals Market in India. Vikram Hosangady, Head of Transaction Services in India spoke on the Chemicals Industry and keys to successful M&A deals in India and Vir Lakshman, Chemicals and Pharmaceuticals Sector Head in Germany moderated a lively panel discussion on Capturing Profitable Growth in India.

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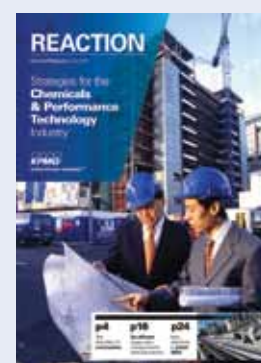
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